



Potential impacts of COVID-19 research on livestock health research and innovation

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ICBAR IFPRI: Building back better: How can public food and agricultural research institutions be strengthened and rebuilt after the COVID-19 pandemic?

Webinar: 2nd February 2021.

The importance of infectious diseases

➤ Animal health

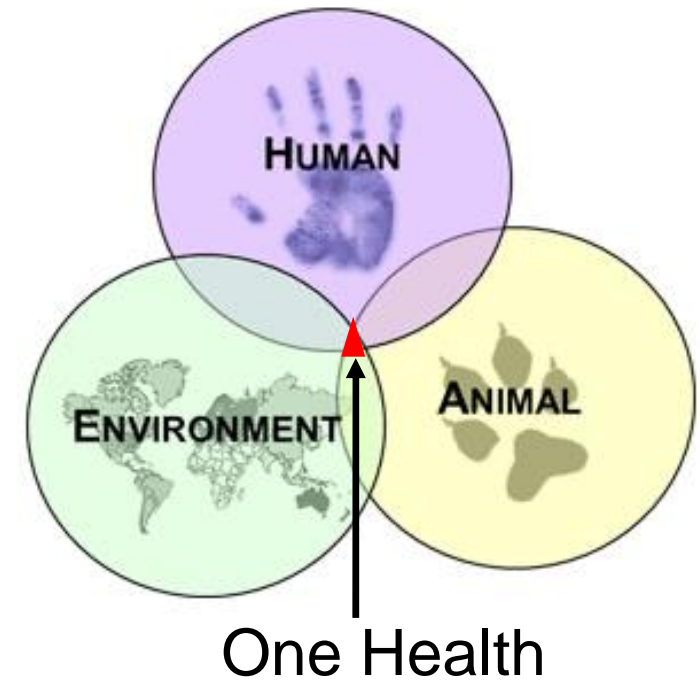
- Animal diseases cost several \$ billions a year
- Many tropical diseases represent neglected problems

➤ Human health

- Foodborne disease causes over 2 billion people to fall ill / year
- Most animal source food in developing countries is sold in wet markets and most is unsafe

➤ Environmental health

- 75% of new human diseases emerge from animals, many have a wildlife-livestock interface



COVID-19 has re-focussed global attention on infectious diseases

COVID-19 has re-emphasized a need for tools

➤ Health tools required in a disease outbreak

- Diagnostics to implement bio-security measures to prevent spread
- Drugs to treat infection or reduce severity of disease and prevent death
- Vaccines to prevent or reduce severity of disease and prevent death

➤ Vaccination is a cost-effective and sustainable strategy to combat infectious diseases

- Developing vaccines is a long and risky business, high cost and high failure rates

COVID-19 vaccine technologies being used

➤ Genetic vaccines

- Pfizer/BioNTech and Moderna (mRNA platforms)

➤ Vectored vaccines

- AstraZeneca/Oxford (ChAdOx1 platform)

➤ Recombinant protein-based vaccine

- Novavax (nanoparticle platform)

➤ Inactivated pathogen-based vaccines

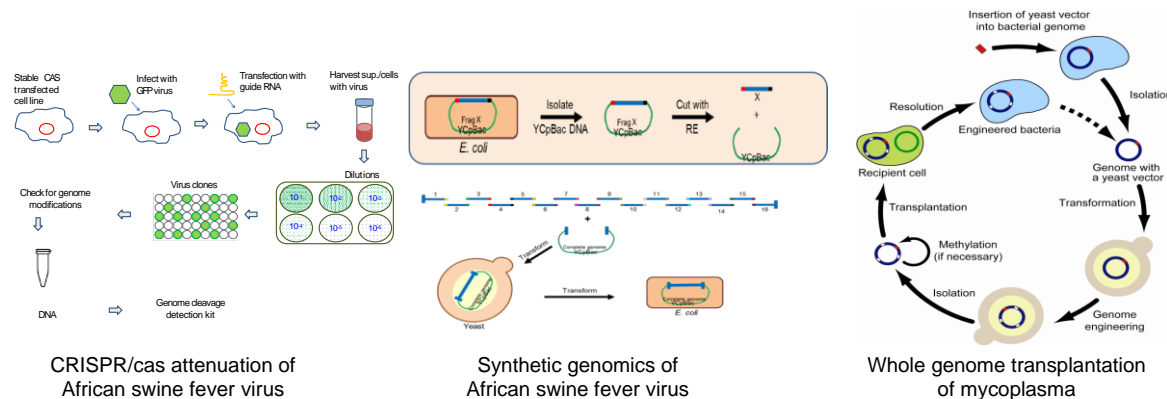
- Sinopharm, Sinovac, Bharat Biotech

➤ Live attenuated pathogen-based vaccines

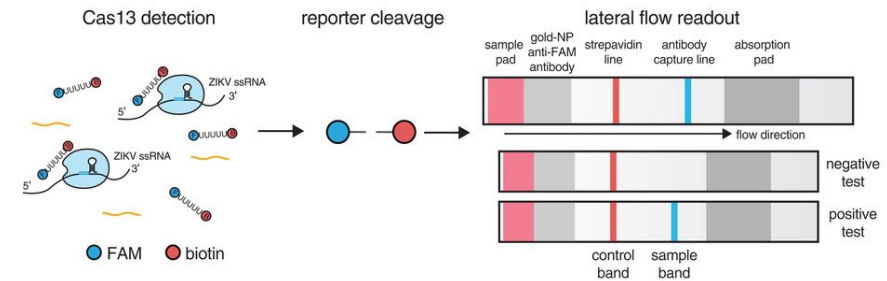
- Still in pre-clinical phase

Use of CRISPR/cas and synthetic genomics

Novel live attenuated vaccines



Novel diagnostic tools



Adapted from Gootenberg JS *et al.*, Multiplexed and portable nucleic acid detection platform with Cas13, Cas12a, and Csm6. 2018

collateral trans-cleavage :
specific high-sensitivity enzymatic reporter unlocking (SHERLOCK)

Lucilla Steinaa and Elise Schieck, AHH program, ILRI

Nick Svitek, AHH program, ILRI


Potential impact of COVID-19 on livestock health

- Increased investment in livestock zoonoses research and control
- Use livestock to test novel vaccine technologies for zoonotic diseases
- Lead to increased knowledge and research tools for livestock health research *per se*



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